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ALEXANDRIA FIELD OFFICE

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BIOLOGICAL EVALUATION OF BLACKHEADED PINE SAWFLY ON THE RAVEN DISTRICT OF THE SAM HOUSTON NATIONAL FOREST

by

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Abstract

A biological evaluation of blackheaded pine sawfly (Neodiprion excitans, Roh.) infestations was conducted on the Raven District of the Sam Houston National Forest in Texas. Compartments 28, 36, 39, and 40 have sustained varying levels of defoliation since the summer of 1981. Heavy defoliation is now present on approximately 1,000 acres of timber, primarily shortleaf pine, in compartments 36, 39, and 40. Light to moderate defoliation is present on 2,500-3,500 acres of compartments 28, 36, 39, and 40. Over 125 MBF of pine timber was salvaged from these areas in the spring of 1983. Branch samples from heavily infested areas showed sawfly larvae to range in numbers from 11 to 50 per 2 1/2 ft branch sample. Forest Pest Management (FPM) recommends that all preparations be made to allow aerial spray of insecticide in the infested area. This would include a Pesticide Use Proposal and Environmental Analysis Report. The ideal spray dates should be between September 15 and October 1, but since these dates cannot be met this fiscal year, FPM will continue to evaluate the infestation and make recommendations consistent with the pest population fluctuation.

INTRODUCTION

A biological evaluation was conducted on the Raven District on the National Forests in Texas to determine the status of blackheaded pine sawfly (PS) populations. An entomologist from Forest Pest Management (FPM), Alexandria, LA, Field Office conducted the evaluation with the aid of District personnel on July 28 and 29, 1983.

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Compartments 28, 36, 39, and 40 on the Raven District have 5,345 acres of loblolly and shortleaf pine. Shortleaf is predominant (75%) on about 500 acres, but accounts for less than 40% of the volume on the other stands (fig. 1). Loblolly stands have from 15-40% shortleaf pine. Most stands were naturally regenerated. Major uses of this area include timber, hunting, hiking, and, where the land adjoins Lake Conroe, water sports.

The PS infestation has been present on this District since the summer of 1981 (Nettleton, 1981). Nettleton's report revealed heavy defoliation on approximately 1,000 acres of compartments 36, 39, and 40. A further 4,000 acres was judged to be light to moderately defoliated.

Further defoliation occurred the next year (1982), and, subsequently, over 125 MBF has been salvaged due to both the mortality attributed to both the defoliation, and Ips spp. attacking weakened trees.

METHOD OF EVALUATION

One dominant or co-dominant shortleaf tree was felled in each of the three areas judged to be heavily infested by the PS (fig. 1). Pine sawfly larvae were counted and collected from three 2.5 ft branch sections randomly selected from the crown of host trees. Completely defoliated branches were not considered since all larvae would leave the branch once the host foliage was consumed.

The percent of branches with more than 50% defoliation was estimated by counting all branches with >50% defoliation and dividing by the total number of branches.

RESULTS AND DISCUSSION

There are approximately 1,000 acres of pine (primarily shortleaf) heavily defoliated by the PS (fig. 1). There are 2,500-3,500 acres lightly to moderately defoliated. Compartments 36, 39, and 40 are most severely affected although light defoliation was also seen in Compartment 28. Pine sawfly larvae were found to be in the fourth and fifth instars at the time the evaluation was conducted. No specific parasite was noted, but the sluggish behavior of some larvae suggests parasitism. The heaviest parasite activity usually occurs during the pupal stage of the PS.

Average defoliation for all shortleaf pines in the area was 50% (sample trees were used as a basis for determination, then compared with the residual stand). Loblolly pines were being defoliated, but to a lesser extent than the shortleaf pines. Loblolly trees were not felled, but frass beneath these trees indicated the presence of PS larvae.

Since this defoliation is heaviest during the fall and at least one more generation of the PS will be present during 1983, it is probable that up to 70% of the shortleaf in the heavily infested area will go through the

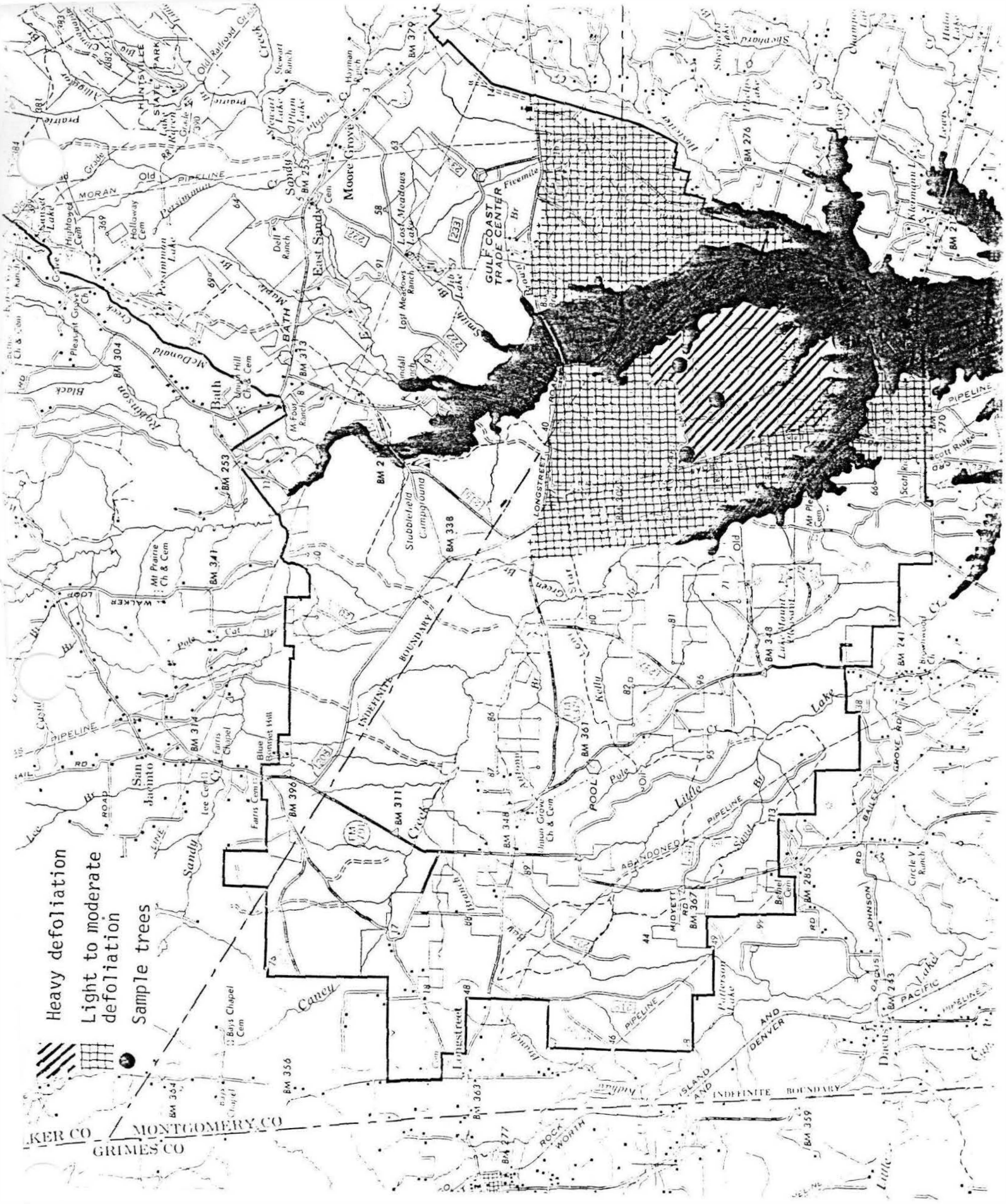

Fig. 1. Map of infested area.

winter without any needles. The resulting loss of vigor could cause outright death of these trees due to nutrient depletion, and the trees that survive will have a loss of vigor which will predispose them to bark beetle infestation. This District has endured one of the largest bark beetle outbreaks ever recorded in the National Forests in Texas (Oliveria & Nettleton, 1983) and there is concern that this SPB infestation will spill over into the PS infested areas.

A separate survey to determine the presence of annosus root rot was conducted by a pathologist from the Alexandria Field Office (Rep. No. 83-2-20). Annosus root rot was confirmed for the compartments where sawfly defoliation is taking place.

CONCLUSIONS

Outbreaks of the PS occur sporadically. Usually, parasites and predators control the PS after a few generations. This biological control is not yet evident for the PS on the Raven District.

There has already been timber mortality due to annosus root rot and defoliation by the PS. Therefore, it is probable that more timber (primarily shortleaf) in compartments 36, 39, and 40 may die due to repeated PS defoliation. A large bark beetle population (SPB and Ips spp.) currently infesting the Raven District could add dramatically to this mortality if these insects become established in the compartments where the PS is present.

Annosus root rot is a compounding factor which will add to outright timber mortality by itself, as well as contribute to the death of PS defoliated trees. Annosus root rot sites are generally also high hazard southern pine beetle sites. Management strategies for the prevention or control of annosus root rot can be found in FPM report number 83-2-20.

Further salvage operations by District personnel are not feasible at this time due to manpower, marketing, and logging constraints placed on Raven District personnel by the current southern pine beetle problem. However, FPM does recommend, that where possible, an accelerated timber sales program be initiated for the heavily infested area. Further preventative measures will need to be taken to mitigate the annosus root rot problem (see FPM Report No. 83-2-20).

Forest Pest Management recommends that the heavily infested PS area (fig. 1) be sprayed with a combination of Sevin® and Orthene® to mitigate the effects of defoliation by the PS. This is a direct control approach.

A spray program would accomplish these goals:

1. Protect timber in compartments 36, 39, and 40 from further defoliation and death. This would also preclude the need to retally any sales due to mortality occurring in the areas that are marked, but not yet harvested.

2. Prevent further flooding of the salvage timber market in the New Waverly area.

3. Prevent further PS population buildup and the possible heavy defoliation of loblolly pines in compartments 36, 39, and 40.

4. Increase the resistance of timber in compartments 36, 39, and 40 to bark beetle infestations by reducing the PS infestations and keeping tree vigor as high as possible.

5. Prevent loss of timber volume that would occur if trees died and were not salvaged.

Sevin (carbyryl) would be aerially sprayed at the rate of one and one-quarter pounds active ingredient per acre. A 150 ft buffer zone around Lake Conroe and a 50 ft buffer around all permanent streams will be used. Helium balloons or a similar substitute will be used to delineate treatment boundaries and to establish buffer zones near riparian areas.

An aerial spray of Orthene (one lb per acre active ingredient) is recommended for the 150 ft buffer zone around Lake Conroe since it is readily hydrolyzed in water and has very little hazard to fish and wildlife. No spray is recommended for the 50 ft buffer areas on streams since boundary lines would be difficult to establish and maintain. A pesticide "sticking" agent is recommended to hold the insecticide in place and assure control of the PS.

A helicopter is recommended as the aircraft necessary to accomplish the spray project. The maneuverability of this kind of craft is necessary to minimize drift and to maximize spray efficiency.

There are red cockaded woodpecker colonies inside the proposed treatment area. After consultation with wildlife biologists, an appropriate buffer zone will be designated around each active colony. This will assure the protection of this endangered species.

While the pine sawfly population should be sprayed during this fall (1983), the procedure that must be followed before this project could begin precludes this possibility. Forest Pest Management will continue to monitor the PS population and make recommendations on successive generations. Since the PS is a recurring problem, FPM recommends that all administrative preparation be made to permit a spray operation to be conducted in this area. This will speed reaction time should a spray be required at a future date.

LITERATURE CITED

Thatcher, Robert C. Pine sawfly, Neodiprion excitans Roh. Forest Pest Leaflet No. 105. Washington D.C.: U.S. Department of Agriculture. Forest Service: 1971. 4 p.

Mistretta, Paul A. Annosus root rot present on the Raven District of the Sam Houston National Forest. Report No. 83-2-20. U.S. Department of Agriculture, Forest Service, Forest Pest Management, Pineville, LA. 1983. 9 p.

Nettleton, Wesley A. Ground detection survey of forest insect and disease activity, Sam Houston National Forest. Report No. 82-2-2. U.S. Department of Agriculture, Forest Service, Forest Pest Management, Pineville, LA. 1981. 3 p.

PRECAUTIONARY STATEMENT

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the labels.

Store pesticides in their original containers under lock and key out of reach of children and animals, and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish and wildlife. Do not apply pesticides when there is danger of drift, when honey bees or other pollinating insects are visiting plants, or in ways that may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear appropriate protective clothing.

If your hands become contaminated with a pesticide, wash them immediately with soap and water. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove the clothing immediately and wash skin thoroughly. After handling or spraying pesticides, do not eat or drink until you have washed with soap and water.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicide from equipment, do not use the same equipment for insecticides or fungicides that you used for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary landfill dump, or crush and bury them in a level, isolated place.

NOTE: Some states have restrictions on the use of certain pesticides. Check your state and local regulations. Also, because registrations of pesticides are under constant review by the U.S. Environmental Protection Agency, consult your county agent, state extension specialist or FPM to be sure it is still registered for the intended use. For further information or assistance, contact Forest Pest Management, Alexandria Field Office, Pineville, La., 71360, (Telephone: FTS 497-7280, or Commercial 318/473-7280).

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